

Name: \_\_\_\_\_

### at1118paper: Complete the Square (v411)

#### Example

By completing the square, find both solutions to the given equation:

$$x^2 - 38x = -325$$

Add  $(\frac{-38}{2})^2$ , which equals 361, to both sides of the equation.

$$x^2 - 38x + 361 = 36$$

Factor the left side.

$$(x - 19)^2 = 36$$

Undo the squaring. We need to consider both  $\pm\sqrt{36}$ .

$$x - 19 = -6$$

or

$$x - 19 = 6$$

$$x = -25$$

or

$$x = -13$$

#### Question 1

By completing the square, find both solutions to the given equation:

$$x^2 - 34x = -240$$

$$x^2 - 34x + 289 = 49$$

$$(x - 17)^2 = 49$$

$$x - 17 = \pm 7$$

$$x = 10 \quad \text{or} \quad x = 24$$

#### Question 2

By completing the square, find both solutions to the given equation:

$$x^2 + 22x = -120$$

$$x^2 + 22x + 121 = 1$$

$$(x + 11)^2 = 1$$

$$x + 11 = \pm 1$$

$$x = -12 \quad \text{or} \quad x = -10$$

### Question 3

By completing the square, find both solutions to the given equation:

$$x^2 - 40x = 624$$

$$\begin{aligned}x^2 - 40x + 400 &= 1024 \\(x - 20)^2 &= 1024 \\x - 20 &= \pm 32 \\x = -12 &\quad \text{or} \quad x = 52\end{aligned}$$

### Question 4

By completing the square, find both solutions to the given equation:

$$x^2 + 40x = 384$$

$$\begin{aligned}x^2 + 40x + 400 &= 784 \\(x + 20)^2 &= 784 \\x + 20 &= \pm 28 \\x = -48 &\quad \text{or} \quad x = 8\end{aligned}$$

### Question 5

By completing the square, find both solutions to the given equation:

$$x^2 - 10x = 200$$

$$\begin{aligned}x^2 - 10x + 25 &= 225 \\(x - 5)^2 &= 225 \\x - 5 &= \pm 15 \\x = -10 &\quad \text{or} \quad x = 20\end{aligned}$$

### Question 6

By completing the square, find both solutions to the given equation:

$$x^2 - 36x = -275$$

$$\begin{aligned}x^2 - 36x + 324 &= 49 \\(x - 18)^2 &= 49 \\x - 18 &= \pm 7 \\x = 11 &\quad \text{or} \quad x = 25\end{aligned}$$